NAVSEA
STANDARD ITEM

FY-01

ITEM NO: 009-74
DATE: 23 SEP 1999
CATEGORY: I

1. SCOPE:

1.1 Title: Man-Made Mineral Fiber Thermal Insulating Material; control

2. REFERENCES:

a. None.

3. REQUIREMENTS:

3.1 Accomplish the following for the control of respirable fibers during insulation and lagging operations. Ensure that responsibilities for personnel safety and control of insulating materials are assigned and implemented.

3.1.1 Maintain written substantiation of the credentials of the Qualified Person.

3.1.1.1 The Qualified Person shall be capable of specifying the necessary protection and precautions to be taken during work with thermal insulation. The Qualified Person shall have received specific training in air sampling by a Certified Industrial Hygienist on an annual basis and training in asbestos sampling and fiber counting (National Institute for Occupational Safety and Health [NIOSH] 582 Course or equivalent). Successful participation, on a continuing basis, in the American Industrial Hygiene Association (AIHA) Program for asbestos, or equal, shall be required for the person counting fiber samples. Persons performing analysis of fiber type on bulk samples shall have received training in microscopic analysis of asbestos and successfully participate, on a continuing basis, in the Environmental Protection Agency (EPA) Asbestos Bulk Sample Analysis Quality Assurance Program or equivalent.

3.1.2 Maintain a copy of the program to ensure personnel accomplishing work have direct knowledge of requirements prior to beginning work. The program shall be under the supervision of a Qualified Person as defined in 3.1.1.1.

3.1.3 Conduct periodic inspections of affected areas and adjacent areas to ensure work area containments and work practices are effective.

3.1.4 Conduct air sampling ***during initial work operations to accurately represent airborne fiber concentrations adjacent to the work area. Monitoring shall be as follows:***

3.1.4.1 At least one sample shall be collected during each four hours of work. The sample shall be of sufficient volume to accurately read concentrations of less than the limits specified in Attachment A.

3.1.4.2 Monitoring shall continue until it is demonstrated to the SUPERVISOR that work will not result in fiber levels equal to or greater than one f/cc.

3.1.4.3 Monitoring is not required for operations that are less than one hour in length and wet methods are employed.

3.1.5 Isolate and blank ship's ventilation systems in work areas to prevent contamination of ventilation systems and other compartments.

3.1.6 Equip vacuum cleaners and exhaust vents with high efficiency particulate air (HEPA) filters.

3.1.7 Collect and dispose of insulation waste, scrap, debris, and special clothing consigned for disposal, which may produce airborne concentrations of fibers, in sealed, impermeable polyethylene bags (minimum thickness six mils). Prior to placing into bags, waste shall be wet down to reduce airborne concentration of fibers.

3.1.8 Vacuum outer surface of bags containing insulation material and dispose of bags after establishing control measures, as needed, to prevent mishandling that could result in spills and personnel exposure.

3.1.9 Comply with local environmental regulations for disposal of waste thermal insulation.

3.1.10 Submit four legible copies of a report to the SUPERVISOR that verifies that the airborne concentration of fibers is below ***the levels specified in Attachment A*** upon completion of work.

3.1.11 Remove insulation and lagging from salvage or scrap equipment, piping, and structural components prior to delivery to the Government.

4. NOTES:

4.1 Examples of man-made mineral fiber thermal insulating material which may be respirable (diameter of less than three microns) are:

Ceramic Fiber
Mineral (Rock or Slag) Wool
Fibrous Glass

ATTACHMENT A

Exposure limits for MMVFs

The exposure limits for MMVFs arederived in part fromthe ACGIH 1998 TLVs:

1.	*Continuous filament glass fibers*	*1 f/cc*	*(a)*
2.	*Continuous filament glass fibers*	*5mg/m³*	*(b)*
3.	*Glass wool fibers*	*1 f/cc*	*(a)*
4.	*Rock wool fibers*	*1 f/cc*	*(a)*
5.	*Slag wool fibers*	*1 f/cc*	*(a)*
6.	*Special purpose glass fibers*	*1 f/cc*	*(a)*
7.	*Refractory ceramic fibers*	*1 f/cc*	*(a)*
8.	*Refractory ceramic fibers (high temperature)*	*.05 mg/m³*	*(c)*

(a) Fibers longer than 5 µm; diameter less than 3 µ; aspect ratio greater than 5:1 as determined by the membrane filter method at 400-450X magnification (4-mm objective) phase contrast illumination.

(b) Inhalable fraction. The concentration of inhalable particulate for the application of this exposure limit is to be determined from the fraction passing a size-selector with the characteristics of Si (d)=50% x (1 + $e^{-0.06d}$) for 0< d ≤100 µm where Si (d) = the collection efficiency for particles with aerodynamic diameter d in µm.

(c) High temperature means use temperature of >850ºC. Operations involving the removal of "high temperature" refractory ceramic fiber (RCF) materials shall adhere to an exposure limit of 0.05 mg/m³ respirable crystalline silica dust. The reason for this variation is that, at high temperatures, RCF will convert to cristobalite, a form of crystalline silica dust. The concentration of respirable particulate for the application of this exposure limit is to be determined from the fraction passing a size-selector with the characteristics of SR=SI(d) [1-F(x)] with Γ=4.25 µm and Σ=1.5 and where F(x)= the cumulative probability function of a standardized normal variable, x. The variable x can be found by using the following formula:

$$x = \frac{In\ (d/\Gamma)}{In\ (\Sigma)}$$